

Decision 19-05-018 May 16, 2019

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to  
Adopt Biomethane Standards and  
Requirements, Pipeline Open Access  
Rules, and Related Enforcement  
Provisions.

Rulemaking 13-02-008

**DECISION REGARDING BIOMETHANE  
TASKS IN SENATE BILL 840**

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## **DECISION REGARDING BIOMETHANE TASKS IN SENATE BILL 840**

### **Summary**

Today's decision addresses the actions required of the Commission, as set forth in Public Utilities Code Section 784.1. That law requires the California Public Utilities Commission to reevaluate its requirements and standards adopted pursuant to Section 25421 of the Health and Safety Code for injecting biomethane into common carrier pipelines. The law further states that, if appropriate, the Commission shall change its biomethane requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made by the California Council on Science and Technology's Senate Bill (SB) 840 study.

After careful consideration of the recommendations of the California Council on Science and Technology, we: (1) resolve to lower the heating value to 970 British Thermal Units (BTU)/standard cubic feet (scf) from 990 BTU/scf, where such a limit is established, while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas (2) maintain the current siloxane limits until there is further evidence to justify modifying the limits, as it is appropriate in the interest of pipeline integrity and safety; (3) direct the gas utilities to submit, within 30 days of the date of this decisions, a proposed modification to their interconnection tariffs for a biomethane project applicant to request reduced siloxane requirements for certain feedstocks pursuant to this decision; and (4) direct the gas utilities to submit proposals to modify their pipeline interconnection tariff to establish a process for consideration of requests for blending in the pipeline, including heating value exceptions, if applicable.

This proceeding is remains open.

## **1. Background**

The California Public Utilities Commission (Commission) established Rulemaking (R.) 13-02-008, to consider and adopt biomethane standards and requirements, pipeline open access rules, and related enforcement provisions pursuant to key legislative action. First, Assembly Bill (AB) 1900<sup>1</sup> amended and added several code sections to the Public Utilities Code<sup>2</sup> pertaining to biogas and biomethane. AB 1900 enacted Health and Safety Code Section 25421 which required the Commission to adopt standards for constituents of concern in biomethane injected into a common carrier pipeline. This legislation also required the Commission to adopt monitoring, testing, reporting, and recordkeeping protocols to ensure the safety and integrity of pipelines and pipeline facilities. Pursuant to AB 1900, this Commission, with the assistance of the California Air Resources Board (CARB) and the Office of Environmental Health Hazard Assessment (OEHHA), as well as parties to this rulemaking, adopted Decision (D.) 14-01-034, establishing standards for 17 constituents of concern<sup>3</sup> found in biomethane. One of the 17 constituents of concern is siloxane.

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<sup>1</sup> Assembly Bill (AB) 1900, enacted into law in Chapter 602 of the Statutes of 2012.

<sup>2</sup> All subsequent section references are to the Public Utilities Code unless otherwise specified.

<sup>3</sup> CARB and OEHHA identified the following 12 constituents of concern that can potentially be present in biomethane: (1) antimony; (2) copper; (3) p-Dichlorobenzene; (4) ethylbenzene; (5) hydrogen sulfide; (6) lead; (7) methacrolein; (8) n-Nitroso-di-n-propylamine; (9) mercaptans; (10) toluene; (11) Vinyl chloride; and (12) arsenic. These twelve constituents were deemed to have environmental or human health impacts and maximum permissible concentrations were accounted for. The natural gas utilities identified, and the Commission adopted, the following five constituents which pose a risk of equipment damage and catalyst poisoning: (1) siloxanes; (2) ammonia; (3) hydrogen; (4) mercury; and (5) biologicals.

Siloxane<sup>4</sup> poses a “risk of equipment damage and catalyst poisoning.”<sup>5</sup> Thus, D.14-01-034 adopted monitoring, testing, reporting, and recordkeeping requirements for biomethane injected into the natural gas utilities’ pipelines. Importantly, adherence to these standards and protocols ensures that human health, and the integrity and safety of the gas pipelines and pipeline facilities, are protected.

Following D.14-01-034, the Commission, in D.15-06-029, addressed cost issues associated with meeting the biomethane standards and requirements adopted in D.14-01-034. In D.15-06-029, the Commission also adopted a biomethane monetary incentive program designed to encourage biomethane producers to design, construct, and safely operate projects that interconnect and inject biomethane into California’s natural gas utilities’ pipeline systems. Pursuant to the requirements of AB 2313 (2016), the monetary incentive program was modified in D.16-12-043.

In 2016, the California Legislature addressed biomethane in Senate Bill (SB) 840.<sup>6</sup> Among the findings and declarations, the Legislature stated the following in Section 10 of SB 840:

- (d) Biomethane provides a sustainable and clean alternative to natural gas. If 10 percent of California’s natural gas use were to be replaced with biomethane use, emissions of

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<sup>4</sup> According to the California Council on Science and Technology (CCST), “Siloxanes are manmade compounds, and there is no known biological process that forms them .... Siloxanes are used in the manufacture of personal hygiene, health care, and industrial products. As a consequence of their widespread use, siloxanes are found in wastewater and solid waste deposited in landfills.” California Council on Science and Technology, *Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxanes Specifications* at 23.

<sup>5</sup> *Id.* at 23.

<sup>6</sup> SB 840, enacted into law in Chapter 341 of the Statutes of 2016.

greenhouse gases would be reduced by tens of millions of metric tons of carbon dioxide equivalent every year.

- (e) Investing in biomethane would create cobenefits, including flexible generation of electricity from a renewable source that is available 24 hours a day, reduction of fossil fuel use, reduction of air and water pollution, and new jobs.
- (f) Biomethane can also be used as transportation fuel or injected into natural gas pipelines for other uses. The most appropriate use of biomethane varies depending on the source, proximity to existing natural gas pipeline injection points or large vehicle fleets, and the circumstances of existing facilities.
- (g) The biomethane market has been slow to develop in California because the collection, purification, and pipeline injection of biomethane can be costly.
- (h) Biomethane is poised to play a key role in future natural gas and hydrogen fuel markets as a blendstock that can significantly reduce the carbon footprint of these two fossil-backed alternative fuels.
- (i) Biomethane is one of the most promising alternative vehicle fuels because it generates the least net emissions of greenhouse gases. According to the low carbon fuel standard regulations (Subarticle 7 (commencing with Section 95480) of Article 4 of Subchapter 10 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations) adopted by the State Air Resources Board, vehicles running on biomethane generate significantly lower emissions of greenhouse gases than vehicles running on electricity or fossil fuel-derived hydrogen.

In one of the Legislature's findings and declarations with respect to the CCST, the following was stated:

- (k) The [CCST] was uniquely established at the request of the Legislature for the specific purpose of offering expert advice to state government on public policy issues significantly related to science and technology.<sup>7</sup>

In Section 11 of SB 840, the Legislature added (previously said it is Pub. Util. unless otherwise cited)

Section 784.1. It states:

- (a) The Legislature requests that the [CCST] undertake and complete a study analyzing the regional and gas corporation specific issues relating to minimum heating value and maximum siloxane specification for biomethane before it can be injected into common carrier gas pipelines, including those specifications adopted in Sections 4.4.3.3 and 4.4.4 of commission Decision 14-01-034 (January 16, 2014), Decision Regarding the Biomethane Implementation Tasks in Assembly Bill 1900. The study shall consider and evaluate other states' standards, the source of biomethane, the dilution of biomethane after it is injected into the pipeline, the equipment and technology upgrades required to meet the minimum heating value specifications, including the impacts of those specifications on the cost, volume of biomethane sold, equipment operation, and safety. The study shall also consider whether different sources of biogas should have different standards or if all sources should adhere to one standard for the minimum heating value and maximum permissible level of siloxanes. The study shall develop the best science reasonably available and not merely be a literature review.

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<sup>7</sup> SB 840, Section 10, Findings and Declarations.

If the CCST agrees to undertake the study, within six months of its completion, the commission was directed to: “reevaluate its requirements and standards adopted pursuant to Section 25421 of the Health and Safety Code relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made in the study by the [CCST].”  
Section 784.1(c).

A second bill addressing biomethane was adopted in 2016. AB 2313,<sup>8</sup> changes the monetary incentive program adopted in D.15-06-029, and adds Sections 399.19 and 784.2. Section 399.19 extends the monetary incentive program to December 31, 2021, and increases the incentive amounts for non-dairy cluster biomethane projects to \$3 million from \$1.5 million, and for dairy cluster biomethane projects, an increase in the incentive amounts to \$5 million from \$1.5 million. The Commission implemented these changes in D.16-12-043.

Pursuant to SB 840 and D.16-12-043, the Commission contracted with CCST to conduct the study called for by § 784.1. CCST completed its study and presented its findings, conclusions, and recommendations in a public workshop on June 11, 2018 held at the Commission’s San Francisco headquarters. This decision reviews CCST’s recommendations, the parties’ positions on CCST’s recommendations, and make determinations on the issues addressed. Below, we discuss the issues, as identified in the assigned Commissioner's scoping memo.

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<sup>8</sup> AB 2313, enacted into law into Chapter 571 of the Statutes of 2016.



## 2. Purpose of Proceeding

This proceeding remained open to re-evaluate the adopted requirements and standards that CCST examined in its study.

In June 2018, CCST published its study, *Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications* (CCST).

On July 5, 2018, the assigned Commissioner issued an amended scoping memo and ruling. The scoping memo and ruling set forth the category, issues to be addressed, and the schedule of the proceeding.

### 2.1. Issues

Parties filed comments to the Scoping Memo on July 27, 2018. As set forth in the Scoping Memo, the issues to be addressed are:

1. **Heating Value Specification Number:** whether the Commission should allow biomethane injection with a heating value as low as 970 British Thermal Units (BTU)/standard cubic feet (scf), provided the biomethane being injected satisfies the current Wobbe Number limits and all other requirements?
2. **Maximum Siloxane Concentrations for Biomethane:** whether, given that CCST reports there is insufficient evidence available to determine whether the Commission's maximum siloxane limit of 0.1 mg Si/m<sup>3</sup> is too stringent or not stringent enough to meet safety requirements, this requirement should remain unchanged?
3. **Reduced Verification Requirements:** The CCST Study recommends considering a reduced and simplified verification regime to avoid unnecessarily encumbering sources that do not produce siloxanes. (Summary Report, at 12-13.) Should the Commission approve reduced and simplified verification requirements for biomethane from dairies, agricultural waste, and/or forestry residues? If so, what requirements should apply?

- 4. Waiver Process for Blending in Certain Locations:** The CCST study concluded that blending of upgraded biogas with natural gas in or at the pipeline might allow safe pipeline movement of upgraded biogas that does not meet all specifications, but only under very specific conditions. (Summary Report, at 15.) Should there be a process for biomethane producers to request utility approval of a lower heating value standard at locations where specific conditions (volume of injection, location of injection, location of end uses, volume throughput, customer usage, configuration of local pipeline system, etc.) ensure that adequate blending will occur by the time the gas arrives at end-use equipment? If so, what should that process consist of?
- 5. Extension of Monetary Incentive Programs:** under Decision 16-12-043 and Assembly Bill 2313, the Commission was directed to: (1) extend the monetary incentive program to December 31, 2021; (2) for non-dairy cluster biomethane projects, increase the total available incentive limitation from \$1.5 million to \$3 million; (3) for a dairy cluster biomethane project, the total available incentive limitation amount is \$5 million; and (4) Section 399.19 is to “remain in effect only until January 1, 2022, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2022, deletes or extends that date.”<sup>9</sup>

Parties that filed comments to the scoping memo include: (1) the Bioenergy Association of California (BAC); (2) DTE Biomass Energy (DTE); (3) the Gas Technology Institute (GTI); (4) CR&R Incorporated (CR&R); (5) California Association of Sanitation Agencies (CASA); (6) Climate Resolve; (7) Clean Energy; (8) Agricultural Energy Consumers Association (AECA); (9) Maas Energy Works; (10) Hydrogenics USA, Inc.; (11) San Diego Gas & Electric Company (SDG&E), Southern California Gas Company (SoCalGas); (12) Southwest Gas Corporation; (13) Pacific Gas and Electric Company (PG&E);

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<sup>9</sup> This issue is not addressed in this Decision.

(14) Alaska Applied Sciences, Inc.; (15) East Bay Municipal Utility District (EBMUD); (16) Harvest Power, Inc.; (17) Giner ELX; (18) California Hydrogen Business Council; (19) Dairy Cares; (20) California Energy Exchange; (21) Central California Asthma Collaborative, Leadership Counsel for Justice and Accountability; (22) DVO, Inc.; (23) National Fuel Cell Research Center; (24) AquaHydrex, Inc.; (25) Coalition for Renewable Natural Gas, Inc.; (26) California Natural Gas Vehicle Coalition; (27) Bloom Energy; (28) Planet Hydrogen; (29) ITM Power Inc.; and (30) California Bioenergy. Several of the above parties also filed reply comments.

### **3. Discussion**

At the threshold, it is useful to describe what the terms “biogas” and “biomethane” mean in the context of California’s gas regime. The term “biogas” is defined in Health and Safety Code § 25420 to mean “gas that is produced from the anaerobic decomposition of organic material,” while the term “biomethane” is defined to mean “biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of [Health and Safety Code] Section 25421 for injection into a common carrier pipeline.”

In Decision (D.) 14-01-034,<sup>10</sup> we commented further upon the definitions:

Biogas can be processed or upgraded to increase the percentage of methane in the gas by removing CO<sub>2</sub> and other trace components. When biogas is upgraded to pipeline quality, it is referred to as biomethane. Conversion of biogas into biomethane typically requires water removal, CO<sub>2</sub> separation (using adsorption, absorption, membrane separation, or cryogenic distillation technology), and compression. During biogas upgrading, trace constituents are

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<sup>10</sup> D.14-01-034 at 10.

removed to levels comparable to or below those in traditional pipeline natural gas.

Further in D.14-01-034, we determined that biomethane offers several benefits including: (1) supporting energy diversity as a renewable energy source; (2) reducing greenhouse gas emissions; (3) promoting sustainable waste management practices, and (4) the creation of new jobs through the production and use of biomethane.<sup>11</sup> We now turn to the discussion of CCST's conclusions and recommendations.

### **3.1. Heating Value Specification Number**

#### **3.1.1. CCST Study: Heating Value and Wobbe Number**

The heating value (HV) of biomethane is regulated to ensure that gas used by consumers provides the appropriate energy content and heat required by commonly-used equipment. Specifically, the Wobbe Number represents the rate of energy delivered through a fixed orifice at a constant pressure, and is calculated by dividing the higher heating value of the gas by the square foot of the specific gravity of the gas.<sup>12</sup> Together, the heating value and Wobbe Number are commonly used measures of gas quality.<sup>13</sup> Meeting the Wobbe Number limits is a critical safety requirement to ensure that different utility supply gases are interchangeable, and that combustion is consistent and will not cause equipment or appliance performance problems that could pose a safety concern for utility end user customers.

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<sup>11</sup> D.14-01-034 at 12.

<sup>12</sup> CCST Study at 16.

<sup>13</sup> CCST Study at 17.

Biomethane typically has a lower heating value than natural gas.<sup>14</sup> Maintaining the heating value in a gas supply is important for product quality, consumer safety and expectations, and for safe transport and combustion of gas. California's gas distribution system serves millions of end-users each day on a wide range of devices that vary from small-scale devices such as natural gas barbeque grills to large-scale industrial equipment used continuously such as oil refineries.

In D.06-09-039 and D.14-01-034, we first determined, and then upheld, the current heating value requirement for biomethane injection at 990 British Thermal Units (BTU) per standard cubic feet (scf) for SoCalGas and SDG&E.<sup>15</sup> Pursuant to SB 840, we re-evaluate the current heating value requirement in light of CCST's findings and conclusions. CCST's study states that scientific modeling provides evidence that keeping the minimum Wobbe Number and relaxing the HV specification to a level near 970 is unlikely to impact safety or equipment reliability.<sup>16</sup>

CCST states that empirical evidence from scientific literature contains several data points supporting the safe operation of appliances and commercial equipment at a heating value of 970 BTU/scf.<sup>17</sup> CCST states that evidence does not support further reduction of the minimum HV to 950 BTU/scf without

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<sup>14</sup> *Id.*

<sup>15</sup> D.14-01-034 did not adopt a minimum heating value standard for PG&E or Southwest Gas because their process sets a specific heating value standard for each injection location. (D.14-01-034, at 92). For PG&E we stated: "The gas shall have a heating value that is consistent with the standards established by PG&E for each Receipt Point." (D.14-01-034 at 88-89.)

<sup>16</sup> CCST Study at 41.

<sup>17</sup> CCST Study at 25.

further research because safety for end user utility customers could be compromised and there have been few interchangeability studies at this low level for appliances tuned to historical gas supplies in California.<sup>18</sup> Thus, CCST concluded that the evidence supports keeping the current minimum Wobbe Number requirements and relaxing the heating value specification to a level near 970 BTU/scf.<sup>19</sup> In the scoping memo, we asked whether the Commission should allow biomethane injection with a heating value as low as 970 BTU/scf, provided the biomethane being injected satisfies the current Wobbe Number limits and all other requirements.

### **3.1.2. Positions of Parties**

In their comments and reply comments, parties responded to CCST's recommendation to lower the heating value and maintain the existing Wobbe Number requirements.

Biomethane developers and biomethane market proponents generally support CCST's recommendation to lower the heating value to 970 BTU/scf. BAC asserts that it strongly supports CCST's recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU.<sup>20</sup> BAC contends that lowering the heating value will "reduce individual project costs by \$1 million or more as it would in many cases reduce the need for secondary biomethane purification."<sup>21</sup> Likewise, DTE supports further reducing the heating value in

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<sup>18</sup> CCST Study at 41.

<sup>19</sup> CCST Study at 41-2.

<sup>20</sup> BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 7; Reply Comments, August 31, 2018.

<sup>21</sup> *Id.*

California between 950 BTU and 970 BTU.<sup>22</sup> DTE stated it encourages the Commission to consider “heating values below [970 BTU.]”<sup>23</sup> GTI argues that reducing the heating value of pipeline biogas to as low as 970 BTU should be done in consultation with California’s natural gas utilities.<sup>24</sup> CR&R asserts that it strongly supports CCST’s recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU.<sup>25</sup> CASA echoed BAC’s arguments. CASA argues that it strongly supports CCST’s recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU and in doing so, individual project costs would be reduced by \$1 million or more as it would “reduce the need for secondary biomethane purification equipment....”<sup>26</sup> Climate Resolve stated that reducing the heating value to as low as 970 BTU will “help reduce short-lived climate pollutants and improve air quality.”<sup>27</sup>

Additionally, Clean Energy advocated for reducing the heating value of pipeline biogas to 950 BTU or a range of 950 to 970 BTU.<sup>28</sup> Clean Energy argued that such a range would reduce project developer costs by a \$1 million or more and cites that a number of pipelines across the country have a minimum heating

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<sup>22</sup> DTE Biomass Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 6, 2018 at 3-4; Reply Comments, August 31, 2018.

<sup>23</sup> *Id.*

<sup>24</sup> GTI on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 6.

<sup>25</sup> CR&R on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5.

<sup>26</sup> CASA on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 6; Reply Comments, August 31, 2018.

<sup>27</sup> Climate Resovle on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5-6.

<sup>28</sup> Clean Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 9; Reply Comments, August 31, 2018.

content specification of 950 BTU.<sup>29</sup> AECA strongly supports the recommendation to allow biomethane injection with a heating value as low as 970 BTU.<sup>30</sup> Maas Energy Works supports lowering the BTU/scf minimum to 970 due to “findings of the report and the consequential effects on California Dairy Cluster projects.”<sup>31</sup>

Harvest Power, Inc. supports CCST’s recommendation to reduce the heating value to 970 BTU/scf as this will “ensure that a wider range of biomethane projects are built in California” and will “avoid the costly process of blending biomethane with natural gas prior to injection into the natural gas grid.”<sup>32</sup> Dairy Cares argues that the Commission should “give due deference to the CCST recommendation to allow biomethane injection with a heating value as low as 970 BTU/scf.”<sup>33</sup> DVO, Inc. agrees with CCST’s recommendation to allow biomethane injection with a heating value of 970 BTU/scf.<sup>34</sup> The Coalition for Renewable Natural Gas believes that there is “sufficient precedent to substantiate, if not warrant, a reasonable minimum heating value requirement between 950 and 970 BTU/scf.”<sup>35</sup>

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<sup>29</sup> *Id.*

<sup>30</sup> AECA Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 2.

<sup>31</sup> Mass Energy Works on the Assigned Commissioner’s Scoping Memo and Ruling, July 6, 2018 at 3; Reply Comments, August 31, 2018.

<sup>32</sup> Harvest Power on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 2 eply Comments, August 31, 2018.

<sup>33</sup> Dairy Cares on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 3.

<sup>34</sup> DVO Comments on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 2; Reply Comments, August 31, 2018.

<sup>35</sup> Coalition for Renewable Natural Gas on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 3-5.



Bloom Energy asserted that it supports the allowance of biomethane injection into a California pipeline at a heating value of 970 BTU/scf as long as the biomethane meets all other requirements.<sup>36</sup> California Bioenergy strongly supports CCST's recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU/scf.<sup>37</sup>

The Central California Asthma Collaborative and Leadership Council advocated for a series of issues including transparency and accessibility to the process, consideration of health and safety issues presented by the entire lifecycle of biomethane production for workers and the public, protect ratepayers for subsidizing unreasonable biomethane projects costs, and mitigation of local pollution at biomethane production facilities.<sup>38</sup>

California's utilities also concurred with CCST's recommendation. SDG&E and SoCalGas jointly stated that based on its recent interchangeability study, their Rule 30 heating value limit could be reduced to 970 BTU/scf for all supplies, not just biomethane injection, so long as all of the rest of Rule 30 requirements are met. They jointly stated further, that SoCalGas found that the lower heating value is not an issue as long as the Wobbe Number is within the 1279 to 1385 range and total inerts remain below 4%.<sup>39</sup>

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<sup>36</sup> Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 4; August 31, 2018.

<sup>37</sup> California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3-4.

<sup>38</sup> Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018.

<sup>39</sup> SoCal Gas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling, July 7, 2018 at 3.

Southwest Gas stated that the heating value could be as low as 970 BTU/scf provided that the gas supply meets all other existing gas quality requirements, including the Wobbe Number.<sup>40</sup>

PG&E agrees with CCST's recommendation of a minimum heating value as low as 970 BTU/scf provided that "(a) the gas supply meets the Wobbe Index guidelines established and used by PG&E for certain geographic areas on the pipeline system, and (b) all other existing gas quality requirements are maintained."<sup>41</sup> PG&E concluded that while it agreed that a 970 BTU/scf minimum heating value is acceptable, it must be in conjunction with meeting the Wobbe Number guidelines for safe combustion.<sup>42</sup>

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas stated they do not support lowering the minimum heating value to 950 BTU/scf without further study and collaboration with stakeholders to ensure critical safety requirements are met.<sup>43</sup> They contend that heating value at 950 BTU/scf: (1) increases the potential for appliance performance issues, including safety issues such as outages and carbon monoxide formation; (2) increases the potential for undercooked food for customers that rely on preset cooking times; and (3) increases the potential of exceeding the utilities' inerts limits, carbon dioxide limits, and interchangeability requirements.<sup>44</sup>

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<sup>40</sup> Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

<sup>41</sup> PG&E on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 2.

<sup>42</sup> *Id.*

<sup>43</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 2.

<sup>44</sup> *Id.*

Cal Advocates submitted reply comments supporting a minimum heating value of 970 BTU/scf. Cal Advocates argues that 970 BTU/scf represents an economically feasible heating value standard that would not serve as a barrier to the development of biomethane projects. Furthermore, Cal Advocates asserts that the CCST Report provides evidence that lowering the heating value to 970 BTU/scf from 990 BTU/scf would “unlikely impact the safety of end-use equipment, provided all other gas quality specifications, including the Wobbe number, are satisfied.”<sup>45</sup> Cal Advocates also agreed with findings of the CCST Report that as a 950 BTU/scf standard could present challenges and adverse interactions with current appliances and equipment in California, trigger corrosion-related safety issues, and create the potential for timed cooking equipment to lead to undercooked food if unadjusted.<sup>46</sup> EBMUD “strongly supports” CCST’s recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU/scf.<sup>47</sup>

### **3.1.3. Determination**

Before discussing the recommendations of CCST and the arguments presented by the parties, we must keep in mind that the Health and Safety Code § 25421(c) provides that the Commission is responsible for protecting human health and protecting the integrity and safety of California’s natural gas pipeline and pipeline facilities. In keeping with the requirements of Health and Safety Code § 25421, we consider the recommendations of CCST pursuant to § 784.1 and the parties’ arguments pertaining to lowering the heating value.

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<sup>45</sup> CalPA on the Assigned Commissioner’s Scoping Memo and Ruling at 1.

<sup>46</sup> *Id.* at 1-2.

<sup>47</sup> EBMUD on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 4.

California's current minimum heating value requirement is 990 BTU/scf. In D.14-01-034, we upheld the prior determination in D.06-09-039 to set the minimum heating value in California at 990 BTU/scf. We affirmed the 990 BTU/scf minimum heating value in D.14-01-034 because there was a lack of scientific evidence available at the time to support lowering the heating value and biomethane proponents did not present sufficient evidence to show a how a lower heating value would not adversely affect California's gas distribution systems and consequently, not harm the end user utility customers.<sup>48</sup> Today, however, CCST has presented sufficient scientific evidence to support adjusting the minimum heating value to 970 BTU/scf from 990 BTU/scf and the parties agree, as discussed here.

The majority of parties support CCST's conclusions that justify lowering the minimum heating value to 970 BTU/scf from 990 BTU/scf. However, some parties such as Clean Energy, DTE, and the Coalition for Renewable Gas, support a 950 BTU/scf heating value or a band of 950 BTU/scf to 970 BTU/scf heating value.

We are not persuaded by the arguments presented in favor of a 950 BTU/scf heating value or a lower heating value band between 950 and 970 BTU/scf at this time. The scientific evidence presented by CCST does not support that range as an acceptable band to control natural gas characteristics that can be consumed by end users while maintaining safety, reliability, and environmental performance. Due to the lack of empirical interchangeability studies at a 950 BTU/scf heating value level, there is uncertainty regarding

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<sup>48</sup> D.14-01-034 at 102-109.

impacts, including corrosion-related safety issues if maximum carbon dioxide specifications are loosened to accommodate gas with a lower heating value, interaction with the existing California appliance and equipment base, and ability to adequately adjust timed cooking equipment to prevent undercooked food.

Parties in favor of a 950 BTU/scf or a band between 950-970 BTU/scf have not introduced any scientific evidence to demonstrate that lowering the heating value to these levels will not cause end use equipment problems. Instead, they only rely on the argument that other states allow biomethane to have a minimum heating value of 950 BTU/scf, or close to that number, and so California, should likewise lower its minimum heating value. As the joint utilities put it, “[b]oth [Coalition for Renewable Natural Gas] and DTE cite to minimum heating value limits in other states as justification that California should follow suit. However, both ignore the difference in the gas make-up and historical uses in the various states. While a certain gas specification may be appropriate in one state, it may not be appropriate for another.”<sup>49</sup> We agree with CCST, Cal Advocates, the joint utilities and find the argument for a 950 BTU/scf minimum heating value unpersuasive at this time. Relying on other states’ requirements with no scientific evidence to support such a change in California is not a sufficient justification to lower the heating value when such a change could adversely affect the integrity and safety of California end use equipment to utility customers.

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<sup>49</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 2-3.

We are persuaded by CCST's and the other parties' comments to lower the heating value to 970 BTU/scf from 990 BTU/scf as long as current Wobbe Number requirements are satisfied and all other requirements of utility gas tariffs are met. There are several reasons to support this determination.

First, we are persuaded by CCST's conclusions that the evidence suggests that a reduction of the minimum heating value specification to a level near 970 BTU/scf would be acceptable from both safety and equipment durability perspectives.<sup>50</sup> The CCST Study notes that current scientific literature provides several empirical examples in which appliances exhibit no safety or operational issues when switching from baseline gases (with higher heating value and Wobbe characteristics) to a fuel with a heating value of approximately 970 TU/scf as long as Wobbe Number requirements and all other requirements of utility gas quality tariffs are met.<sup>51</sup>

Second, parties agree with CCST's conclusion as illustrated by the record of this proceeding. A significant majority of parties recommended that we lower the minimum heating value to 970 BTU/scf. For example, Cal Advocates supports a minimum heating value of 970 BTU/scf because of the empirical evidence presented by CCST. Cal Advocates contends that CCST's evidence demonstrates that lowering the heating value to 970 BTU/scf from 990 BTU/scf would "unlikely impact the safety of end-use equipment, provided all other gas quality specifications, including the Wobbe number, are satisfied."<sup>52</sup> Similarly, the utilities jointly state that they support the recommendations made by CCST

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<sup>50</sup> CCST Study at 40.

<sup>51</sup> CCST Study at 41.

<sup>52</sup> CalPA on the Assigned Commissioner's Scoping Memo and Ruling at 1.

to allow biomethane injection with a heating value as low as 970 BTU/scf as long as all other requirements of utility gas quality tariffs are met.<sup>53</sup> Bloom Energy supports the allowance of biomethane injection into a California pipeline at a heating value of 970 BTU/scf as long as the biomethane meets all other requirements.<sup>54</sup> BAC strongly supports CCST's recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU.<sup>55</sup> BAC contends that lowering the heating value will "reduce individual project costs by \$1 million or more as it would in many cases reduce the need for secondary biomethane purification."<sup>56</sup> And California Bioenergy strongly supports CCST's recommendation to reduce the heating value of pipeline biogas to as low as 970 BTU/scf.<sup>57</sup>

Finally, based on the scientific evidence presented, lowering the heating value to 970 BTU/scf from 990 BTU/scf while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas tariffs will not contravene the Commission's safety mandates codified in Health and Safety Code § 25421(c). Therefore, we will lower the minimum heating value standard to 970 BTU/scf. At this time, we make this change only for SoCalGas and SDG&E's tariff. PG&E and Southwest Gas are not subject to the minimum heating value standard adopted in our prior decisions because their tariffs

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<sup>53</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 2.

<sup>54</sup> Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018; August 31, 2018.

<sup>55</sup> BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 7; Reply Comments, August 31, 2018.

<sup>56</sup> *Id.*

<sup>57</sup> California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018.

provide for a specific heating value established by the utility for each location. However, in their comments, PG&E and Southwest Gas do support a minimum heating value of 970 BTU/scf. Therefore, the Commission may consider requiring these utilities to modify their tariffs in the future to allow at least this minimum heating value. PG&E and Southwest Gas are authorized to file Advice Letters to implement this minimum heating value if they so desire. .

### **3.2. Maximum Siloxane Concentration**

#### **3.2.1. CCST Study: Maximum Siloxane Concentrations for Common-Carrier Pipelines**

Pursuant to Health and Safety Code § 25421, in D.14-01-034, we adopted a standard specifying the permissible concentration of siloxane, a constituent of concern, because of the potential that deposition of siloxane on equipment could adversely impact the operation of equipment. As part of its mandate under § 784.1, CCST evaluated the California's maximum siloxane standard, as adopted in D.14-01-034. CCST determined there is not enough evidence available to conclude whether 0.1 milligram (mg) silicon/cubic meter (Si/m<sup>3</sup>) is too stringent or not stringent enough to meet safety requirements and therefore, recommended to retain California's existing standard.<sup>58</sup> After publication of new research regarding siloxanes, the CCST Study team re-evaluated the evidence and re-affirmed its recommendation to maintain the existing siloxane standard.<sup>59</sup> In the Scoping Memo, we asked whether, given CCST's conclusions that there is insufficient evidence available to determine whether California's siloxane limit is

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<sup>58</sup> CCST Study at 56.

<sup>59</sup> CCST Facilitated Expert Opinion -- The Updated State of Science Regarding Maximum Permissible Siloxane Concentration, received October 30, 2018.



too stringent or not stringent enough, should the requirement remain unchanged.

### **3.2.2. Position of Parties**

In their comments and reply comments, parties addressed CCST's recommendation to maintain the existing maximum siloxane concentration standard. However, several parties asserted that the siloxane standard should be higher.

BAC supports CCST's recommendation to conduct additional research on the siloxane standards.<sup>60</sup> DTE states that the current siloxane limit of .1mg Si/m<sup>3</sup> is "far too stringent for biomethane operations in California" and siloxane "does not pose a problem for human health and safety, as it is found in a variety of household products such as shampoo and deodorants."<sup>61</sup> DTE strongly supports the "need to reduce verification and reporting requirements for source biomethane that is unlikely to include siloxanes."<sup>62</sup> EBMUD,<sup>63</sup> CR&R,<sup>64</sup> GTI,<sup>65</sup> and California Bioenergy<sup>66</sup> support CCST's recommendation to conduct additional research to determine whether the current siloxane standard is appropriate.

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<sup>60</sup> BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 7; Reply Comments, August 31, 2018.

<sup>61</sup> DTE Biomass Energy on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 4-5; Reply Comments, August 31, 2018.

<sup>62</sup> *Id.*

<sup>63</sup> EBMUD on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 4.

<sup>64</sup> CR&R on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 5.

<sup>65</sup> GTI on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 6-7.

<sup>66</sup> California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

Likewise, CASA supports CCST's recommendation to conduct additional research to determine whether the siloxane standard is appropriate and suggests that research include an examination of wastewater treatment.<sup>67</sup> Climate Resolve stated that additional research is needed to determine whether the siloxane standard is sufficiently or over-protective.<sup>68</sup>

Additionally, Clean Energy stated it is supportive of CCST's recommendation to conduct additional research to develop an appropriate siloxane standard but "this should not prevent the Commission from reexamining the need to relax the current siloxane standard as it creates a substantial barrier to starting up many in-state biomethane projects."<sup>69</sup>

Harvest Power asserts that the maximum siloxane limit of .1 Si/m<sup>3</sup> is far too stringent for biomethane projects and should be "substantially increased."<sup>70</sup> The Coalition for Renewable Natural Gas recommends that the Commission allow biomethane to be injected with a provisional siloxane standard of 1 part per million (ppm), provided certain conditions such as volume of injection, location of injection, location of end uses, volume throughput, customer usage,

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<sup>67</sup> CASA on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 6; Reply Comments, August 31, 2018.

<sup>68</sup> Climate Resolve on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 5.

<sup>69</sup> Clean Energy on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 9-10; Reply Comments, August 31, 2018.

<sup>70</sup> Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 2; Reply Comments, August 31, 2018.

configuration of the pipeline ensure that adequate blending occur by the time the processed gas arrives at end-use equipment.<sup>71</sup>

Bloom Energy asserts that the maximum siloxane concentration for biomethane should remain unchanged.<sup>72</sup>

The Central California Asthma Collaborative and Leadership Council advocated for the Commission to prioritize worker, public health, and safety when considering the use of varying quantities of siloxane.<sup>73</sup>

California's utilities also concurred with CCST's recommendation. SDG&E and SoCalGas jointly stated that they agree with maintaining the siloxane limit of .1 mg Si/m<sup>3</sup> until additional studies provide evidence to support a different limit.<sup>74</sup> Furthermore, in their comments, they reference their own studies which purport to show siloxane limits of .1 Si/m<sup>3</sup> as an appropriate limit to protect end user equipment.<sup>75</sup>

Southwest Gas stated it agrees with CCST's conclusion that there is insufficient evidence to determine whether the current siloxane standard should be changed.<sup>76</sup>

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<sup>71</sup> Coalition for Renewable Natural Gas on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 5-8.

<sup>72</sup> Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 5-6; August 31, 2018.

<sup>73</sup> Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018.

<sup>74</sup> SoCal Gas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

<sup>75</sup> *Id.*

<sup>76</sup> Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

PG&E agrees with CCST's recommendation that there is insufficient information available to determine whether the current siloxane standard should be changed.<sup>77</sup> PG&E recommends, as a safety precaution, that the current siloxane standard remain unchanged until sufficient studies can be performed to understand the physical impact of the combustion of siloxanes on customer end-use equipment.<sup>78</sup>

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas stated while some parties requested that the current limits on siloxanes should be increased, no party provided scientific evidence to justify increasing siloxane limits.<sup>79</sup> The joint utilities took issue with some parties' argument that siloxanes do not pose a risk to human health.<sup>80</sup>

They argue this is an incorrect interpretation of CCST's report which acknowledges that "post-combustion, the siloxanes form silica and agglomerate to form silica nanoparticles, which could potentially have detrimental health impacts" and "deposition of silica on equipment can cause a wide variety of operational issues and hazards. Possible direct health impacts are not well known and need more study."<sup>81</sup>

Cal Advocates recommends that the current maximum siloxane requirement should remain unchanged until there is sufficient evidence to determine whether the limit is too stringent or not stringent enough and

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<sup>77</sup> PG&E on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

<sup>78</sup> *Id.*

<sup>79</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 5-6.

<sup>80</sup> *Id.*

<sup>81</sup> *Id.*

supported additional research to extrapolate upon the issue.<sup>82</sup> Cal Advocates took issue with some parties' arguments that the lack of evidence to retain the current standard supported relaxing or removing it all together. Cal Advocates rebutted, arguing that if "anything, the lack of conclusive evidence about whether the current standard is too stringent or not stringent enough supports being conservative in the interest of protecting safety."<sup>83</sup>

### **3.2.3. Determination**

Health and Safety Code § 25421 requires the Commission to protect human health, and the integrity and safety of the pipeline and pipeline facilities. § 784.1 requires the Commission to reevaluate its requirements pursuant to Health and Safety Code § 25421 and if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations in the study by CCST.

CCST states there is not enough information available to determine whether 0.1mg Si/ m<sup>3</sup> is too stringent or not stringent enough to meet safety requirements.<sup>84</sup> As a result CCST concludes there is not enough evidence to recommend any change to the maximum allowable siloxane concentration.<sup>85</sup> Even after reviewing newly published research, the CCST Study team affirmed its recommendation to maintain the current siloxane standard.

We are not persuaded by arguments that because CCST found insufficient evidence to determine whether the maximum siloxane limit of .1mg Si/ m<sup>3</sup> is

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<sup>82</sup> CalPA on the Assigned Commissioner's Scoping Memo and Ruling at 1.

<sup>83</sup> *Id.* at 1-2.

<sup>84</sup> CCST Study, at 56.

<sup>85</sup> CCST Study at 56.

appropriate, the .1 mg Si/m<sup>3</sup> should be eliminated or modified. Such parties have not offered sufficient evidence or sufficient scientific evidence into this proceeding to demonstrate that relaxing the siloxane standard will not cause equipment or end-user problems. To be sure, Coalition for Renewable Natural Gas (CRNG) argues that the fact that there is insufficient evidence available to determine whether the Commission's maximum siloxane limit of .1mg Si/m<sup>3</sup> is too stringent or not stringent enough to meet safety requirements is "evidence in and of itself that such a standard is ancillary" and that if "siloxanes were an issue," then "studies would have been commissioned, reports published and data available after nearly 40 years of biomethane injection into common carrier pipelines across the United States." We disagree.

As Health and Safety Code § 25421(c) clearly states, the standards for siloxane - and its peer constituents of concern — are those that are reasonably necessary to ensure the protection of human health and for the integrity and safety of the pipeline and pipeline facilities. We believe it is prudent to maintain the current siloxane limit until there is compelling evidence to justify a change. We find it appropriate to defer to the recommendation in the CCST Study and we decline to make any changes to the current maximum siloxane limit of .1 mg Si/m<sup>3</sup> at this time.

### **3.3. Reduced Verification Requirements for Sources Unlikely to Contain Siloxane**

#### **3.3.1. CCST Study: Reduced Verification Requirements for Sources Unlikely to Contain Siloxane**

Public Utilities Code Section 784.1 directed that the CCST study should "also consider whether different sources of biogas should have different standards or if all sources should adhere to one standard for the minimum heating value and maximum permissible levels of siloxanes." In D.14-01-034, the

Commission, finding that siloxane could “pose a risk of equipment damage and catalyst poisoning,” established a “trigger level” of 0.01 mg Si/m<sup>3</sup> and a “lower action level” standard for siloxane in biomethane injected into pipelines of 0.1 mg Si/m<sup>3</sup>.<sup>86</sup> For new biomethane sources, samples collected prior to injection may not exceed the lower action level of 0.1 mg Si/m<sup>3</sup>.<sup>87</sup> If the siloxane concentration is above the “trigger level” of 0.01 mg Si/m<sup>3</sup>, quarterly testing is required; if the samples do not exceed 0.01 mg Si/m<sup>3</sup> over four quarters, then further testing is only required every 12 months.<sup>88</sup>

However, siloxane was not identified by the CARB or OEHHA as a constituent of concern regarding potential environmental or human health impacts.<sup>89</sup> Siloxanes are used in personal hygiene, health care and industrial products; as a result they are found in wastewater and solid waste deposited in landfills.<sup>90</sup> CCST noted: “Siloxanes are manmade compounds, and there is no biological process that forms them...”<sup>91</sup> They “are regulated because they affect the expected lifetime of combustion equipment through deposition of silica.”<sup>92</sup>

The CCST Study concluded that because some sources of biomethane are very unlikely to have siloxanes<sup>93</sup> – such as dairies or agricultural waste – they

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<sup>86</sup> CCST Study at 20-21,

<sup>87</sup> *Id.*

<sup>88</sup> *Id.*

<sup>89</sup> D.14-01-034 adopts standards for 12 constituents of concern identified by the CARB, and siloxane is not one of those constituents.

<sup>90</sup> CCST Study, at 23.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.* at 13.

<sup>93</sup> CCST Study at 51.

could be held to a reduced and simplified verification regime. The CCST Study recommends: “Sources in which siloxanes are not expected to be present (such as dairies, food waste digestions, or agricultural waste digestion) ought to be held to a reduced and simplified verification regime to avoid unnecessarily encumbering sources which do not produce siloxanes.”<sup>94</sup>

The Commission issued a Scoping Memo and Ruling dated July 5, 2018 that sought party comments on the CCST Study, including the recommendation regarding siloxane verification. The Scoping Memo asked the parties to comment on whether the Commission should approve a reduced and simplified verification requirement for biomethane from dairies, agricultural waste and/or forest residues and, if so, what requirements should apply.

### **3.3.2. Position of Parties**

In their comments and reply comments, parties stated their positions to CCST’s recommendation to reduce verification requirements for sources unlikely to contain siloxanes.

Biomethane developers and biomethane market proponents generally support CCST’s recommendation to reduce verification requirements for sources unlikely to contain siloxanes. BAC agrees with CCST’s recommendation to reduce the monitoring and verification requirements for siloxanes from biogas sources other than landfill and wastewater treatment facilities.<sup>95</sup> Likewise, DTE supports the CCST study to reduce verification requirements for biomethane

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<sup>94</sup> CCST Study at 57.

<sup>95</sup> BAC Comments on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 7; Reply Comments, August 31, 2018.



from dairies, agricultural waste, and/or forestry residues.<sup>96</sup> DTE stated, “There is no reason to believe that siloxanes would be found in the feedstocks for these biomethane projects, and requiring testing is an undue burden that prevents the economic development of these projects.”<sup>97</sup> Similarly, GTI agrees with CCST’s recommendation to consider reducing the monitoring and verification requirements for siloxanes from biogas sources and other landfill and wastewater treatment facilities.<sup>98</sup> CR&R had no comments on the reduction verification requirements of siloxanes.<sup>99</sup>

CASA agrees with CCST’s recommendation to reduce the monitoring and verification requirements for siloxane from biogas sources other than landfill and wastewater treatment facilities.<sup>100</sup> Climate Resolve agreed, stating that the Commission should follow CCST’s recommendation to modify pipeline biomethane standards by reducing the siloxane monitoring requirements for biogas from sources other than landfills and wastewater treatment facilities.<sup>101</sup>

Additionally, Clean Energy agreed with CCST’s recommendation to reduce the monitoring and verification requirements for siloxanes from biogas

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<sup>96</sup> DTE Biomass Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5; Reply Comments, August 31, 2018.

<sup>97</sup> *Id.*

<sup>98</sup> GTI on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 7.

<sup>99</sup> CR&R on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5.

<sup>100</sup> CASA on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 6; Reply Comments, August 31, 2018.

<sup>101</sup> Climate Resolve on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5.

sources other than landfill and wastewater treatment facilities.<sup>102</sup> Clean Energy recommends that the Commission remove the monitoring of siloxanes all together at these facilities since sources like dairies do not have any siloxane content in their biomethane product.<sup>103</sup> Finally, Clean Energy stated it would support an “interim 1 part per million siloxane standard until the CCST can perform additional research and gather sufficient data to determine if and at what value a siloxane standard is warranted.”<sup>104</sup>

AECA strongly supports a reduced and simplified verification regime for projects, such as dairy biogas, that do not produce siloxanes.<sup>105</sup> Specifically, AECA supports removing “obligations to report on all constituents that are not present in dairy biogas. Testing for and reporting on contaminants that will not be found in dairy biogas unnecessarily adds to cost.”<sup>106</sup> AECA encourages specific testing and reporting requirements for different biogas types.<sup>107</sup>

Maas Energy Works supports the removal of obligations to report on biproducts that are not present within dairy biogas.<sup>108</sup> Maas Energy Works continues to state that dairy feedstocks producing biomethane are drastically different and produce different biproducts.<sup>109</sup> Maas Energy contends that

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<sup>102</sup> Clean Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 10; Reply Comments, August 31, 2018.

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

<sup>105</sup> AECA on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 2.

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

<sup>108</sup> Mass Energy Works on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 3; Reply Comments, August 31, 2018.

<sup>109</sup> *Id.*

reporting obligations should be based on the biproducts of each unique biomethane production method.<sup>110</sup>

Harvest Power agrees with CCST's recommendation to reduce the monitoring and verification requirements for siloxanes from biomethane sources other than landfill and wastewater treatment facilities.<sup>111</sup> Dairy Cares argues that the Commission should "give due deference to the CCST recommendation to [develop] a reduced and simplified verification regime for sources that are very unlikely to have siloxanes such as dairies or agricultural waste."<sup>112</sup> Dairy Cares argue that while it is not clear what types of testing requirements may be necessary for sources of biogas that may contain siloxanes, the CCST report is clear that siloxanes are not found in raw and cleaned dairy biogas.<sup>113</sup>

DVO, Inc. agrees with CCST's recommendation to reduce and simplify the verification regime for sources that do not produce siloxanes including, dairy, agricultural wastes, and/or forestry residues.<sup>114</sup> The Coalition for Renewable Natural Gas recommends that the Commission approve reduced and simplified verification requirements for biomethane from dairies, agricultural waste, and/or forestry residues and adds that these feedstocks should not be subject to testing for siloxane.<sup>115</sup>

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<sup>110</sup> *Id.*

<sup>111</sup> Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 3; Reply Comments, August 31, 2018.

<sup>112</sup> Dairy Cares on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 3.

<sup>113</sup> *Id.* at 3-4.

<sup>114</sup> DVO Comments on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 2; Reply Comments, August 31, 2018.

<sup>115</sup> Coalition for Renewable Natural Gas on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 8.

Bloom Energy asserts that the process to evaluate siloxane levels should remain unchanged and equal for all sources of biomethane.<sup>116</sup> Bloom Energy argues that “[w]ith limited pipeline company resources, sources releasing large amounts for GHG such as landfills or mixed organics may be deprioritized over sources, agricultural waste and/or forestry residue. Equal treatment enables solutions to capture and utilize the methane from all GHG producing sources.”<sup>117</sup> California Bioenergy agrees with CCST’s recommendation to reduce the monitoring and verification requirements for siloxanes from biogas sources other than landfill and wastewater treatment facilities. Furthermore, it argued that this requirement should be waived for 100% dairy biogas sourced biomethane.<sup>118</sup>

The Central California Asthma Collaborative and Leadership Council advocated that “[i]n considering the use of varying quantities of siloxane and heat co-efficiencies used in biomethane production with respect to the price of resulting biomethane, the Commission should prioritize worker and public health and safety.”<sup>119</sup>

In their opening comments, SDG&E and SoCalGas jointly stated that siloxanes are “not likely to be present in dairies, agricultural waste, and/or forestry residues.” However, they state that there is potential that certain chemicals may be introduced in the operations of dairies, agricultural waste, and/or forestry residues that may be introduced in the operation of dairies,

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<sup>116</sup> Bloom Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 5-6; August 31, 2018.

<sup>117</sup> *Id.*

<sup>118</sup> California Bioenergy on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 4.

<sup>119</sup> Central California Asthma Collaborative and Leadership Council, July 27, 2018.

agricultural waste, and/or forestry residues that may make it into the biogas (e.g., facility operations, products used during digestion process, lubricants for equipment operation, etc.).”<sup>120</sup> SDG&E and SoCalGas stated “[w]ithout knowing the detailed operations of the producer, SoCalGas and SDG&E believe it is prudent to verify that siloxanes are not present in each project before eliminating it from periodic testing required by D.14-01-034.”<sup>121</sup>

Southwest Gas believes that reduced or simplified verification requirements can be utilized, as siloxanes are not likely to be present in dairies, agricultural waste, and/or forestry residues.<sup>122</sup> Southwest Gas contends that because of the potential for certain chemicals, such as siloxanes, to be introduced into the gas system as a result of the facility’s operations, it is prudent to verify that siloxanes are not present for a project before eliminating the periodic testing requirement.<sup>123</sup> Thus, Southwest Gas recommended that: (1) if the raw biogas does not contain siloxanes, the periodic testing requirement for siloxanes can be eliminated for that project and (2) periodic testing of the raw biogas for siloxanes be permitted to ensure the raw biogas characteristics have not changed.<sup>124</sup>

PG&E stated it agreed with Recommendation 5 of Appendix O in the CCST study that certain testing requirements as described in PG&E’s Gas Rule 21 could be reduced for biogas sources for which there is zero possibility of the

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<sup>120</sup> SoCal Gas and SDG&E on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 4.

<sup>121</sup> *Id.*

<sup>122</sup> Southwest Gas on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 4.

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*

presence of a constituent described in Gas Rule 21.<sup>125</sup> PG&E stated that if there is any possibility that a constituent of concern may be present in a biogas stream, quality testing should be performed before injection of biomethane into the pipeline.<sup>126</sup> PG&E contends that if, at the conclusions of the testing, such constituents are not found in the biogas stream, future testing can be stopped or minimized so long as the source of biogas remains unchanged.<sup>127</sup> PG&E stated that dairy biogas should continue to be tested for all constituents noted in its Gas Rule 21 but agricultural biomass waste and forestry waste may not need to be tested for siloxane on an on-going basis as this constituent is not present in the natural state for these types of waste.<sup>128</sup>

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas discussed the nuance of siloxane presence in unlikely sources. They explain:

Experience has shown that siloxanes can be found in gas streams from sources that are assumed to not have siloxanes. Siloxanes can be a result of dairy operations or be introduced into biogas from equipment lubricants or co-digestion with organic materials that may include cosmetics, pharmaceuticals, or antifoaming agents. For example, PG&E gas quality tests performed in 2008 at its Vintage Dairy biomethane injection project found that siloxanes were present in dairy gas. While the siloxane levels were below reportable limits, it is evidence that siloxanes can exist in sources thought to not have siloxanes.<sup>129</sup>

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<sup>125</sup> PG&E on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 5-6.

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> *Id.*

<sup>129</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 8.

Additionally, SoCalGas, SDG&E, PG&E, and Southwest Gas disagreed with DTE's argument that requiring testing of siloxanes "is an undue burden that prevents the economic development of these projects."<sup>130</sup> The utilities jointly counter:

The Joint Utilities are informed that the cost of testing siloxanes ranges from \$200 to \$400 per test. This is not an economic burden that would prevent the development of biomethane projects. This is especially true if parties' comments are correct that their projects do not have siloxanes. If so, a biomethane developer's one-time testing cost of \$200 to \$400 is negligible.<sup>131</sup>

In its reply comments Cal Advocates supported consideration of reduced and simplified verification process for siloxane for biomethane from sources such as dairies, agricultural waste, and forestry. Cal Advocates argues that initial testing requirements for siloxane for biomethane from any source should be maintained and that once the test is passed, then "the periodic testing requirements may be reduced."<sup>132</sup>

The California Natural Gas Vehicle Coalition stated that lowering reporting requirements for biomethane sources that do not contain siloxanes is "logical to avoid redundancy and unwarranted regulatory burdens that hinder further commercial adoption of RNG."<sup>133</sup>

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<sup>130</sup> *Id.* at 8.

<sup>131</sup> *Id.*

<sup>132</sup> CalPA on the Assigned Commissioner's Scoping Memo and Ruling at 3.

<sup>133</sup> The California Natural Gas Vehicle Coalition on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018; Reply Comments, August 31, 2018.

### **3.3.3.Determination**

Section 784.1 requires the Commission, after the CCST Study is completed, to reevaluate its requirements and standards for injection of biomethane into pipelines “giving due deference to the conclusions and recommendations made in the study....” Applying deference to CCST’s recommendations and considering the support for reduced siloxane testing requirements expressed by the commenting parties, the Commission finds that it is appropriate to reduce the siloxane testing requirements for the fuel sources identified by CCST as very unlikely to contain siloxanes. As recommended by numerous parties (including SoCalGas and SDG&E), to ensure that in fact the fuel source does not contain siloxanes, an initial test prior to injection into the pipeline shall be required.

Although utilities did identify a dairy facility where biomethane samples contained siloxanes, the more authoritative, published scientific study is cited by CCST that included 42 samples of raw and cleaned biogas from a dozen dairies and found no siloxanes.<sup>134</sup> The requirements set forth below will provide adequate assurance that dairy biomethane injected into pipelines does not contain siloxane.

Although the utilities and the other commenting parties disagree on whether the full siloxane testing/reporting regime is burdensome, there is some additional time, effort and cost involved in collecting and transporting the samples and expense for the laboratory analysis. A standard method for testing siloxane has not yet been adopted by the ASTM International.<sup>135</sup> A standard is

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<sup>134</sup> Gas Technology Institute (Saber, 2009b), cited at CCST Study, at 50.

<sup>135</sup> CCST Study at 55-56.



being developed, and when it is done, it will be tested by labs for 5 years.<sup>136</sup> Several laboratories claim the ability to detect siloxane at the detection levels required by the current Commission approved testing requirements, but parties/developers also express concerns that few labs can reliably do so.<sup>137</sup> The fact that testing for siloxane at the detection level in the current requirements is relatively new and there is no approved standardized method, adds some uncertainty about the costs of the existing quarterly testing requirements. The CCST Study also notes that “due to the investment risk introduced by uncertainty in measurement of siloxanes at these levels, it is likely that the maximum siloxane specification (if unaltered) will continue to serve as a significant barrier to biomethane development in California.”<sup>138</sup> The reduced siloxane testing requirements set forth below for certain fuel sources could help to alleviate this investment risk.

Because there are questions whether some food waste and yard waste may become contaminated with materials containing siloxanes, they will not be eligible for reduced testing at this time, but this may be examined further in the future. However, commercial food processing waste shall be eligible because no risk of contamination was identified.

Accordingly, we direct the utilities to, within 30 days of the date of this decision, submit a proposed modification to their pipeline interconnection tariffs to implement the following modification to the siloxane testing requirements:

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<sup>136</sup> *Id.*

<sup>137</sup> CCST Study at 55.

<sup>138</sup> CCST Study at 58.

- The applicant may certify that (1) the only fuel sources for biomethane produced by the facility seeking to interconnect are: dairy or other animal manure, other agricultural waste, forest residues, and/or commercial food processing waste<sup>139</sup> and (2) products that contain siloxane are not used at the facility in any way that allows them to enter the fuel source.
- If the certifications above are provided, representative biomethane samples must be tested for siloxane prior to injection into the pipeline and must not exceed the siloxane lower action level of 0.1 mg/Cubic Meter (m3).
- If the initial samples do not exceed the trigger level of 0.01 mg Si/m3, then no further testing of biomethane from the facility is required. If initial samples do exceed the trigger level of 0.01 mg Si/m3, quarterly testing is required for one year and if none of those samples exceed the lower action level of 0.1 mg Si/m3, then no further testing is required.
- If the certifications identified above are no longer true, the applicant must notify the utility and the full siloxane testing requirements in the tariff shall apply.

The utilities, at their discretion and at their own cost, may still test pursuant to applicable tariff rules.

### **3.4. Waiver Process for Blending in Certain Locations**

#### **3.4.1. CCST Study: Waiver Process for Blending in Certain Locations**

Section 784.1 directs that the CCST Study of biomethane heating value and siloxane specifications also consider and evaluate “the dilution of biomethane

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<sup>139</sup> CCST includes “food waste digestion” as a source not expected to contain siloxanes (CCST study at 57) and includes “source-segregated organic waste and yard waste” (Summary Report at 2.) By certifying that “only” the listed fuel sources were used, this ensures that any food waste and yard waste was not mixed with any type of fuel that is not on the list.

after it is injected into the pipeline ... ." The CCST study noted that "[d]ilution of biomethane is another option to reach compliance with gas quality specifications."<sup>140</sup> This would occur by "adding non-compliant biomethane directly to the pipeline such that it will be diluted with [natural gas] already flowing in the pipe, so that the resulting mixture will meet gas quality specifications before it arrives at any downstream consumers."<sup>141</sup> The CCST Study noted: "[d]ilution of biomethane after pipeline addition can occur in situations where the biomethane volume is small in proportion to local consumption; however, this must be evaluated on a case-by-case basis."

CCST further concluded that "[b]lending of upgraded biogas with natural gas in or at the pipeline might allow safe pipeline movement of upgraded biogas that does not meet all specifications, but only under very specific conditions, typically dictated by the pipeline company."<sup>142</sup> It noted that the blending could be engineered properly if there is "a consistent, unidirectional flow of natural gas at the point of biomethane addition" and the flow of natural gas is "large enough, relative to the amount of biomethane, that the mixture will remain in compliance with gas quality specifications."<sup>143</sup> The Scoping Memo asked the parties to answer whether there should be a process for biomethane producers to request utility approval of a lower heating value standard at locations where specific conditions (volume of injection, location of injection, location of end uses, volume throughput, customer usage, configuration of local pipeline system, etc.)

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<sup>140</sup> CCST Study at 83.

<sup>141</sup> *Id.*

<sup>142</sup> CCST Summary Report at 15.

<sup>143</sup> CCST Study at 85.

ensure that adequate blending will occur by the time the gas arrives at end-use equipment. The Scoping Memo also asked parties to discuss what that process should consist of.

### **3.4.2. Position of Parties**

In their comments and reply comments, parties stated their positions regarding a waiver process for blending in certain locations.

California Bioenergy,<sup>144</sup> Clean Energy,<sup>145</sup> GTI,<sup>146</sup> CASA,<sup>147</sup> CR&R,<sup>148</sup> and BAC<sup>149</sup> assert that giving producers the flexibility to blend renewable-based natural gas with fossil-based natural gas as an acceptable method to assist renewable natural gas end-product to meet pipeline specifications. Likewise, DTE, “strongly supports allowing producers to blend biomethane with fossil-based natural gas in the pipeline as a way to meet gas quality specifications in California.”<sup>150</sup>

Harvest Power strongly supports the “recommendation that the Commission provide producers with the flexibility to blend renewable gas that

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<sup>144</sup> California Bioenergy on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 5.

<sup>145</sup> Clean Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 10; Reply Comments, August 31, 2018.

<sup>146</sup> GTI on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 7.

<sup>147</sup> CASA on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 6-7; Reply Comments, August 31, 2018.

<sup>148</sup> CR&R on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5-6.

<sup>149</sup> BAC Comments on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 7; Reply Comments, August 31, 2018.

<sup>150</sup> DTE Biomass Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 5-6; Reply Comments, August 31, 2018.

does not achieve the heating value or certain other specifications within the pipeline in certain locations.”<sup>151</sup>

The Coalition for Renewable Natural Gas supports a waiver process for blending in certain locations because this “flexibility is foundational not only to the initial interconnection but continued successful injection and transportation of biomethane via common carrier pipelines across the country.”<sup>152</sup>

Bloom Energy asserts that blending of upgraded biogas with natural gas in or at the pipeline will allow safe pipeline movement of upgraded biogas and could ensure consistency of gas quality throughout the system.<sup>153</sup>

In their opening comments, SDG&E and SoCalGas support CCST’s recommendation to have a process for biomethane producers to request utility approval of a lower heating value (*e.g.*, under 970 BTU/scf) on a case-by-case basis, but their support is “contingent on the lower heating value gas otherwise meeting all of the other SoCalGas Rule 30 and SDG&E’s Rule 30 gas quality specifications when delivered.”<sup>154</sup> SDG&E and SoCalGas stated they currently have a deviation process to allow injection of non-compliant gas which requires an advice letter. They recommend that, subject to compliance with its gas quality specifications, they should be allowed to do this and only be required to notify

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<sup>151</sup> Harvest Power on the Assigned Commissioner’s Scoping Memo and Ruling, July 26, 2018 at 3; Reply Comments, August 31, 2018.

<sup>152</sup> Coalition for Renewable Natural Gas on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 9.

<sup>153</sup> Bloom Energy on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 5; August 31, 2018.

<sup>154</sup> SoCal Gas and SDG&E on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 5.

the “Commission Energy Division prior to accepting receipts instead of a formal advice letter filing.”<sup>155</sup>

Southwest Gas supports a process where, on a case-by-case and location specific basis, utilities can approve a lower heating value standard and should be “contingent upon the evaluation of various factors, to determine whether a gas stream can be blended into the pipeline system to meet all gas quality specifications for delivery.”<sup>156</sup>

PG&E is supportive of a case-by-case location-specific waiver process done in a fair, consistent, transparent, and non-preferential manner where in the utility determines whether a biogas stream with lower than 970 BTU/scf can be accepted for delivery into the pipeline system.<sup>157</sup> PG&E contends that the waiver process must take into account daily location-specific operational conditions before an exception is granted, such as: (1) the interchangeability of the gas at the receipt point; (2) proximity of the gas supply to PG&E customers; (3) changing customer demand profiles; (4) and the historical BTU level received by PG&E’s downstream customers.<sup>158</sup>

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas extrapolated further on this topic. They explain that downstream blending (or blending in the pipeline) is difficult to monitor, and could be nearly impossible to maintain because blending cannot be guaranteed to occur continuously.<sup>159</sup> They

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<sup>155</sup> *Id.*

<sup>156</sup> Southwest Gas on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 4.

<sup>157</sup> PG&E on the Assigned Commissioner’s Scoping Memo and Ruling, July 27, 2018 at 6-7.

<sup>158</sup> *Id.*

<sup>159</sup> SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 9-10.

state that changes made to the pipeline system to accommodate customer growth may also alter the blending of non-compliant gas supplies.<sup>160</sup> Additionally, they argue that changes in the location and magnitude of customer demand on the transmission or distribution system can and does change the direction of flow in the utilities' pipelines, which in turn adversely impacts the ability to sufficiently blend gas supplies before delivery to end-use customers.<sup>161</sup> SoCalGas' asserts that based on its experience, customers have experienced safety incidents such as flame outages when its Rule 30 limits were not met.<sup>162</sup>

In its reply comments, Cal Advocates stated it does not oppose the development of a waiver process for blending at certain locations with traditional natural gas within pipelines on a case-by-case basis, provided the "biomethane meets all other gas quality specifications besides [heating value] and there will be no safety consequences if the target [heating value] is not reached."<sup>163</sup>

### **3.4.3. Determination**

As summarized above, the utilities SoCalGas, SDG&E, Southwest Gas and PG&E expressed support in comments for a case-by-case exception process where the utility determines whether to allow injection of biomethane with a heating value lower than the minimum heating value specification into a pipeline. However, in joint reply comments the utilities express concerns that blending could be difficult to monitor and expressed concerns about the impact

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<sup>160</sup> *Id.*

<sup>161</sup> *Id.*

<sup>162</sup> *Id.*

<sup>163</sup> CalPA on the Assigned Commissioner's Scoping Memo and Ruling at 4.

of changes to the pipeline system, and changes to location and magnitude of customer demand.

California Bioenergy, Clean Energy, Harvest Power, GTI, CASA, CR&R, Bioenergy Association of CA, the Coalition for Renewable Natural Gas, Bloom Energy and Cal Advocates support allowing blending of biomethane with natural gas in the pipeline, in appropriate locations, as a way to meet the heating value specification. SoCalGas and SDG&E indicated they already have a “deviation process” to allow injection of non-compliant gas, but they recommend a simplified process for notification to the Commission.

The Commission must give due deference to the CCST Study, which concludes that allowing such blending might be safe when the biomethane volume is small relative to local consumption, after evaluation on a case-by-case basis. Considering this recommendation, and the positions of the parties, the Commission finds that it is appropriate to direct the gas utilities to file a proposal, within 30 days of the effective date of this decision, to modify their pipeline interconnection tariffs to establish a process for consideration of requests for blending in the pipeline, including “heating value exceptions,” if applicable. Even if a utility’s tariff does not have a heating value standard, it should provide a process to consider requests to allow blending in the pipeline for gas that might not otherwise be allowed to inject into the pipeline. The utilities should propose a uniform process for considering these requests. As described below, the utility proposed process should consider all relevant, site specific information, and adopt conditions that address the concerns that the utilities have identified above. The proposed exception process must include the following elements:



- The utilities will evaluate requests for blending in the pipeline, including a “heating value exception,” if applicable..
- The utilities will evaluate whether it is safe to authorize blending in the pipeline, including a heating value exception, if applicable, based on relevant factors that include the following:
  - The proposed volume, timing, method and location of injection of biomethane;
  - The proposed minimum heating value and Wobbe Number;
  - The daily location-specific operational conditions, including but not limited to the proximity to gas customers, customer demand, historic heating value and Wobbe Number of gas received by the downstream customers, the volume and flow of other sources of natural gas in the pipeline;
  - Pipeline system characteristics;
  - The tariffs shall identify any other relevant factors that the utility will consider; and
  - The tariff shall identify all information that an applicant must provide in a request.
- The utility shall grant a request for blending in the pipeline, including a heating value exception, if applicable, if adequate blending will occur in the pipeline before the biomethane is delivered to customers.
- The utility shall determine the following:
  - Whether blending in the pipeline can be authorized for the requested volume, or for a specific volume that is less than requested;
  - Whether there are seasonal variations in demand that require limits on the authorization for blending in the pipeline;

- How long the authorization for blending in the pipeline is valid before it must be renewed; and
- Whether authorization for blending in the pipeline can be granted only with certain other conditions.
- The utility shall provide the applicant all relevant engineering evaluations and calculations it prepares to evaluate the request for blending in the pipeline (subject to a non-disclosure agreement for confidential information, if any).
- If the request is denied, in whole or part (including reduction in volume or other limitations on injection) the utility shall provide a full written explanation of the basis for its decision to the applicant and the Energy Division (subject to a non-disclosure agreement for confidential information, if any).
- The utility shall notify the Energy Division when it grants or denies a request for blending in the pipeline.
- The tariff shall set forth time frames for the utility to process a request for blending in the pipeline and provide a final decision.

The utilities' proposal submitted for Commission review may also propose allowing the utilities to periodically re-evaluate, and potentially eliminate, the authorization for blending in the pipeline based on changed conditions.

#### **4. Conclusion**

This decision resolves four issues. First, this proposed decision lowers the minimum heating value to 970 BTU/scf, while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas tariffs, will not contravene the Commission's safety mandates, codified in Health and Safety Code Section 25421(c), and will further the Legislature's objectives codified in § 399.24. Second, this proposed decision maintains the current

siloxane limits until there is compelling evidence to justify modifying the limits, as it is appropriate in the interest of pipeline integrity and safety. Third, we direct the utilities to submit, within 30 days of the date of this decision, a proposed modification to their pipeline interconnection tariffs to implement the procedures for simplified siloxane monitoring requirements. Finally, we find it is appropriate for the gas utilities to modify their pipeline interconnection tariff to establish a process for consideration of requests for blending in the pipeline, including heating value exceptions, if applicable.

## **5. Comment Period**

The proposed decision of Commissioner Rechtschaffen in this matter was mailed to parties in accordance with § 311 and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on February 11, 2019 by SoCalGas and SDG&E, SWG, PG&E, AquaHydrex, BAC, Coalition for Renewable Gas, Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability and CASA. California Hydrogen Business Council, PG&E, and ITM Power filed reply comments.

SoCalGas and SDG&E offered four recommendations in their reply comments. First, SoCalGas and SDG&E recommend modifying Ordering Paragraph 4 to require the utilities to file a proposal for a process for considering lower heating value deviations within 30 days of the final decision and for the proposals to be discussed at a future workshop. We agree. This recommendation has been adopted.

Second, they jointly recommend removing yard waste and food waste from reduced siloxane verification requirements. We agree. This recommendation is adopted; however, commercial food processing waste will be

eligible for reduced siloxane verification because no risk of contamination with siloxanes was identified.

Next, SoCalGas and SDG&E assert that the reduced siloxane testing regime for fuel sources that are not expected to contain siloxanes should provide that no further testing is required if initial samples do not exceed the Trigger Level of 0.01 mg Si/m<sup>3</sup>, instead of the Lower Action Level of 0.1 mg Si/m<sup>3</sup>. The current rule already reduces the testing requirements if samples are under the Trigger Level, and this change would not achieve the desired result of eliminating unnecessary testing. Accordingly, we will approve a middle ground. For the identified fuel sources, if initial samples do not exceed the Trigger Level of 0.01 mg Si/m<sup>3</sup>, no further testing is required; if the initial samples do exceed the Trigger Level of 0.01 mg Si/m<sup>3</sup>, quarterly testing shall be conducted for one year, and if those quarterly tests do not exceed the Lower Action Level of 0.1 mg Si/m<sup>3</sup>, then no further testing is required (unless the fuel source is modified).

Fourth, they recommend clarifying that even under the reduced siloxane verification requirement, the utilities will continue to be able to test at their own discretion and cost pursuant to their existing tariff authority. We have added this clarification.

With these modifications to the reduced siloxane verification requirements, we decline to make the changes that SoCalGas and SDG&E recommend to Ordering Paragraph 3.

In its comments, SWG recommended setting the pre-injection testing limit to the Trigger Level of 0.01 mg Si/m<sup>3</sup> instead of the Lower Action Level of 0.1 mg Si/m<sup>3</sup>. This is discussed above. SWG also seeks clarification that the reduced siloxane testing requirements do not preclude a utility from testing the raw biogas as it deems necessary and at the utility's own expense. We have

made this clarification. SWG agrees to modify its tariff to include the process proposed for heating value exceptions where there will be adequate blending in the pipeline. However, it states that it may need to periodically re-evaluate any exception due to potential for changes in pipeline conditions. The utilities may include this in the proposal they submit.

In its comments, PG&E stated it already accepts gas with a heating value of 970 BTU/scf, as long as it is interchangeable with its existing gas supplies. PG&E argued that there is no need for a change to PG&E's Gas Rule 21 to specify that 970 BTU/scf meets its requirements. This issue is already addressed because Ordering Paragraphs 1 and 2, directing reduction of the heating value standard, do not apply to PG&E.

PG&E commented that it relies primarily on the Wobbe Number to determine if gas is "interchangeable." It also commented that it is inappropriate to blend non-compliant gas with compliant pipeline gas in order to meet gas quality limits. By contrast, it applies the gas quality limits at the point of injection into the pipeline. We do not agree that this absolute approach is required. There may be certain locations where adequate blending in the pipeline may occur before gas is delivered to customers. Accordingly, this decision directs PG&E to participate with the other utilities to develop a uniform process for considering requests for blending in the pipeline.

PG&E recommended that the Commission modify the maximum siloxane limit in Conclusions of Law 16 and 17 to 0.01 mg/m<sup>3</sup> to match the trigger level instead of the lower action level, to align with current tariff requirements. This is discussed above. PG&E also stated that food waste and yard should not be eligible for reduced siloxane testing. We have made this change, with the exception of food processing waste. There are questions whether some food

waste and yard waste may become contaminated with materials containing siloxanes, so they are not eligible for reduced testing at this time, but this may be examined further in the future.

The Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability filed comments expressing concern that this decision does not adequately address the public health and local impacts of biomethane production and does not consider any mitigation requirements. They offer that this decision should be revised to account for and evaluate pilot projects which could offer information regarding mitigation of adverse biomethane impacts. We decline to postpone this decision. It is appropriate to adopt revisions to the standards for injection of biomethane into pipelines now, based on the conclusions and recommendations of the CCST Study.

BAC, CASA and AquaHydrex support the Proposed Decision. The Coalition for Renewable Gas supports the Proposed Decision, except it argues that we should increase the siloxane standard because extensive injection of biomethane into pipelines has occurred outside the state with no negative effects reported. For the reasons explained above, we decline to make this change at this time.

## **6. Assignment of Proceeding**

Clifford Rechtschaffen is the assigned Commissioner and Colin Rizzo is the assigned Administrative Law Judge in this proceeding.

## **Findings of Fact**

1. “Biomethane” is biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of [Health and Safety Code] Section 25421 for injection into a common carrier pipeline.

2. Biomethane is made from biological resources, which include biomass, waste including forest and other wood waste, agricultural and food processing waste, organic urban waste, waste and emissions from wastewater treatment facilities, land fill gas and other organic sources.

3. CCST completed a study analyzing the regional and gas corporation specific issues relating to minimum heating value and maximum siloxane specification for biomethane before it can be injected into common carrier gas pipelines, including those specifications adopted in Sections 4.4.3.3 and 4.4.4 of D.14-01-034.

4. Senate Bill 840 directed the Commission to reevaluate its requirements and standards adopted pursuant to §25421 of the Health and Safety Code relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made in the CCST study.

5. CCST does not recommend adopting a 950 BTU/scf minimum heating value because it increases the potential for appliance performance and calibration issues, increases outages and carbon monoxide formation, increases the potential for undercooked food for customers that rely on preset cooking times, and increases the potential for exceeding inert limits, carbon dioxide limits, and interchangeability requirements.

6. CCST states that maintaining the minimum Wobbe Number and relaxing the heating value specification to a level near 970 is unlikely to impact safety or equipment reliability.

7. Adoption of a 970 BTU/scf minimum heating value for biomethane while keeping the current minimum Wobbe Number requirements and all other

requirements of utility gas tariffs will not contravene the Commission's safety mandates under §784.1 and Health and Safety Code §25421(c).

8. CCST recommends no change to California's maximum allowable siloxane standard because there is a lack of scientific evidence to justify any change.

9. CARB and OEHHA determined that siloxane was not a constituent of concern regarding potential environmental or human health impacts.

10. D.14-01-034 found that siloxane could pose a risk of equipment damage and catalyst poisoning.

11. Biomethane produced from dairy or other animal manure, other agricultural waste, forest residues, and commercial food processing waste are not expected to contain siloxanes and ought to be held to a reduced and simplified verification regime to avoid unnecessarily encumbering sources which do not produce siloxanes.

12. Dilution of biomethane is another option to reach compliance with gas quality specifications and occurs by adding non-compliant biomethane directly to the pipeline such that it will be diluted with natural gas already flowing in the pipe, so that the resulting mixture will meet gas quality specifications before it arrives at any downstream consumers.

13. The ability of non-compliant biomethane to be successfully diluted is a fact specific determination and must be evaluated on a case-by-case basis.

### **Conclusions of Law**

1. Health and Safety Code Section 25421 mandates that the California Public Utilities Commission ensure protection for human health and protecting the integrity and safety of California's natural gas and pipeline facilities.



2. Public Utilities Code Section 399.24 mandates that the California Public Utilities Commission adopt policies and programs that promote the in-state production and distribution of biomethane.

3. Public Utilities Code Section 784.1 requires the California Public Utilities Commission to reevaluate, upon receiving the California Council on Science and Technology's biomethane study, its requirements and standards adopted pursuant to Health and Safety Code Section 25421 relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made by the California Council on Science and Technology.

4. Pursuant to Public Utilities Code Section 784.1, the Commission gives due deference to the California Council on Science and Technology's determinations.

5. It is reasonable to adopt a 970 BTU/scf minimum heating value for biomethane while keeping current minimum Wobbe Number and all other requirements of utility gas tariffs because it will further the Legislature's objectives codified in Public Utilities Code Section 399.24 and Section 784.1, and not contravene Health and Safety Code Section 25421.

6. It is reasonable to apply the 970 BTU/scf minimum heating value standard to SoCalGas and SDG&E's tariffs at this time, and to consider applying this standard to PG&E and Southwest Gas' tariffs in the future.

7. The Commission should not adopt the recommendations to lower the minimum heating value below 970 BTU/scf.

8. Pursuant to Public Utilities Code Section 784.1, due deference is given to the California Council on Science and Technology's determination that there is

not enough evidence available to recommend any changes to the maximum allowable siloxane concentration.

9. It is reasonable for the California Public Utilities Commission to maintain its existing siloxane standard until there is scientific evidence available that warrants a reevaluation of the existing siloxane standard.

10. We would not be fulfilling our duty under Public Utilities Code Section 784.1 and Health and Safety Code Section 25421 if we increased current limits on siloxanes.

11. Pursuant to Public Utilities Code Section 784.1, due deference is given to the California Council on Science and Technology's determination that biomethane from sources in which siloxanes are not expected to be present, such as dairy or other animal manure, other agricultural waste, forest residues, and/or food waste digestion, ought to be held to a reduced and simplified verification regime to avoid unnecessarily encumbering sources which do not produce siloxanes.

12. It is reasonable to reduce the siloxane testing requirements for the fuel sources identified by the California Council on Science and Technology as very unlikely to contain siloxanes.

13. It is reasonable to require an initial test, prior to injection into the pipeline, that such fuel sources do not contain more than the maximum allowable amount of siloxanes.

14. It is reasonable to require the four utilities to submit a proposed modification to their tariffs to implement reduced siloxane testing requirements.

15. It is reasonable for the reduced siloxane testing requirements to require an applicant to certify that: (1) the only fuel sources for biomethane produced by the facility seeking to interconnect are dairy or other animal manure, other

agricultural waste, forest residues and/or commercial food processing waste; and (2) products that contain siloxane are not used at the facility in any way that allows them to enter the fuel source.

16. It is reasonable for the reduced siloxane testing requirements to require an applicant to ensure a sample is tested for siloxane prior to the initial injection into the pipeline and must not exceed the siloxane Lower Action Level of 0.1 mg Si/Cubic Meter (m3).

17. It is reasonable for the reduced siloxane testing requirements to not require further mandatory testing of biomethane from the facility if initial samples do not exceed the Trigger Level of 0.01 mg Si/m3. If the initial samples do exceed the Trigger Level of 0.01 mg Si/m3, it is reasonable not to require further mandatory testing if four quarterly samples do not exceed the Lower Action Level of 0.1mg Si/Cubic Meter (m3). However, utilities, at their own discretion and at their own cost, may still test pursuant to applicable tariff rules.

18. It is reasonable for the reduced siloxane testing requirements to require that if certifications identified above are no longer true, the applicant must notify the utility and the full siloxane testing requirements in the tariff shall apply.

19. Pursuant to Public Utilities Code Section 784.1, due deference is given to the California Council on Science and Technology's determination that "[d]ilution of biomethane is another option to reach compliance with gas quality specifications."

20. Due deference is given to the California Council on Science and Technology's determination that dilution of biomethane after pipeline injection can occur in situations where the biomethane volume is small in proportion to local consumption but must be evaluated on a case-by-case basis.

21. It is reasonable to require the four utilities to propose modifications to their pipeline interconnection tariffs to establish a process for consideration of requests for blending in the pipeline, including “heating value exceptions,” if applicable.

22. It is reasonable to require the four utilities to propose a process where they each consider all relevant, site specific information, and adopt conditions that address their concerns.

23. It is reasonable to require the four utilities to propose a process for requests to allow blending in the pipeline, including a “heating value exception” if applicable.

24. It is reasonable to require the four utilities to propose a process for authorizing blending in the pipeline based on relevant factors that may include the proposed volume, timing, method and location of injection of biomethane, the proposed minimum heating value and Wobbe Number, the daily location-specific operational conditions, including but not limited to the proximity to gas customers, customer demand, historic heating value and Wobbe Number of gas received by the downstream customers, the volume and flow of other sources of natural gas in the pipeline, and the pipeline system characteristics.

25. It is reasonable to require the four utilities’ proposed tariff modifications to identify any other relevant factors that the utility will consider in a request for blending in the pipeline, including a heating value exception, if applicable.

26. It is reasonable to require the four utilities proposed tariff modifications to identify all information that an applicant must provide in a request for blending in the pipeline, including a heating value exception, if applicable.

27. It is reasonable to require the four utilities' proposed tariff modifications to allow blending in the pipeline, including a heating value exception, if applicable, if adequate blending will occur in the pipeline before the biomethane is delivered to customers.

28. It is reasonable to require the four utilities' proposed tariff modifications to determine whether blending in the pipeline, including a heating value exception, if applicable, can be authorized for the requested volume, or for a specific volume that is less than requested, whether there are seasonal variations in demand that require limits on the heating value exception, how long the heating value exception is valid before it must be renewed, or whether other conditions should apply.

29. It is reasonable to require each of the four utilities' proposed tariff modifications to provide the applicant all relevant engineering evaluations and calculations it prepares to evaluate the request for blending in the pipeline, including a heating value exception, if applicable (subject to a non-disclosure agreement for confidential information, if any).

30. It is reasonable to require each of the four utilities' proposed tariff modifications, if the request is denied, in whole or part (including reduction in volume or other limitations on injection) to provide a full written explanation of the basis for its decision to the applicant and the Energy Division, subject to a non-disclosure agreement for confidential information, if any.

31. It is reasonable to require each of the four utilities' proposed tariff modifications to notify the Energy Division within 30 days when it grants or denies a request for blending in the pipeline, including a heating value exception.

32. It is reasonable to require the four utilities' proposed tariff modifications to set forth time frames for the utility to process a request for blending in the

pipeline, including a heating value exception, if applicable, and provide a final decision.

## **O R D E R**

1. San Diego Gas & Electric Company and Southern California Gas Company shall reduce the minimum heating value to 970 BTU/scf from 990 BTU/scf for biomethane while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas tariffs, consistent with Health and Safety Code Section 25421.

2. San Diego Gas & Electric Company and Southern California Gas Company -- in compliance with Ordering Paragraph 1 -- shall submit their respective Tier 2 advice letters to the Commission's Energy Division, within 30 days of the effective date of this decision, to change their respective gas tariffs to show compliance with the 970 BTU/scf minimum heating value for biomethane so long as the current minimum Wobbe Number requirements and all other requirements of utility gas tariffs are met.

3. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall submit their respective Tier 2 advice letters to the Commission's Energy Division, within 30 days of the effective date of this decision, proposing to modify their pipeline interconnection tariffs to implement the procedures for reduced siloxane testing requirements, as explicitly stated within Section 3.3.3. of this Decision. The Commission may further evaluate whether yard waste and additional types of food waste should be eligible for reduced siloxane testing in the future.

4. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall submit a joint proposal to this proceeding, within 30 days of the effective date of this decision, to modify their pipeline interconnection tariff to establish a uniform process for consideration of requests to allow blending in the pipeline, including requests for “heating value exceptions” if applicable, as explicitly stated within Section 3.4.3. of this decision. The utilities shall include a uniform proposal in their submission. Energy Division will hold a workshop to discuss the utilities’ proposal within 90 days of the effective date of this decision.

This order is effective today.

Dated May 16, 2019, at Oxnard, California.

LIANE M. RANDOLPH  
MARTHA GUZMAN ACEVES  
CLIFFORD RECHTSCHAFFEN  
Commissioners

I dissent.

/s/ MICHAEL PICKER  
Commissioner

I dissent.

/s/ GENEVIEVE SHIROMA  
Commissioner